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SOLAR ECLIPSES, 1976 – 1980

by

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At the request of Commission 12a of the International Astronomical Union, the American Nautical Almanac Office agreed to publish advance information on solar eclipses, computed from tabular positions of the Sun and Moon prepared for the purpose in the British Nautical Almanac Office.

This *Circular* gives the results of the definitive calculations for all solar eclipses in 1976, 1977, 1978, 1979, 1980, and corrections to the Annular Eclipse of 1973 December 24 (U. S. N. O. Circular No. 101).

The arguments are given in Ephemeris Time (E. T.), and the longitudes are referred to the " Ephemeris Meridian ", (see *Explanatory Supplement to the Astronomical Ephemeris and the American Ephemeris and Nautical Almanac*).

Once the value of $\triangle T$ is known, the accurate position of the track may be obtained in the following manner.

Change all time – arguments into Universal Time by setting.

$$E.T. = U.T. + \triangle T$$

Leave latitudes unchanged, and refer the longitudes to the meridian of Greenwich by applying $-1.002738\,\triangle T$ as a correction to the tabulated longitudes.

East longitudes are negative.

ANNULAR ECLIPSE OF 1976 APRIL 29

Central Line

Ephemeris Time	Latitude	Ephemeris Longitude	Duration	Width of Path	Altitude of Sun
h m	° ′	° ′	m s	*mi*	°
Limit	+ 6 43	+ 40 38	• •• •	•••	••
8 35	9 38.6	30 51.3	4 56.4	181	11
40	12 21.3	23 34.0	5 08.5	176	19
45	14 19.0	18 59.7	5 17.4	172	25
50	15 58.4	15 28.2	5 25.1	170	30
55	17 27.0	12 31.8	5 31.9	166	34
9 00	+18 48.1	+ 9 58.4	5 38.3	164	38
05	20 03.5	7 41.1	5 44.2	162	41
10	21 14.3	5 35.8	5 49.7	159	45
15	22 21.4	3 39.4	5 55.0	157	47
20	23 25.3	1 50.1	5 59.9	155	50
25	24 26.4	+ 0 06.3	6 04.5	153	53
9 30	+25 25.0	− 1 33.2	6 08.9	151	55
35	26 21.2	3 09.4	6 12.9	149	58
40	27 15.4	4 43.0	6 16.7	147	60
45	28 07.5	6 14.8	6 20.2	147	62
50	28 57.8	7 45.2	6 23.4	145	64
55	29 46.3	9 14.9	6 26.3	144	65
10 00	+30 33.0	− 10 44.2	6 28.8	143	67
05	31 18.1	12 13.5	6 31.0	142	68
10	32 01.4	13 43.3	6 32.9	141	69
15	32 43.1	15 13.9	6 34.3	140	70
20	33 23.1	16 45.7	6 35.4	140	70
25	34 01.4	18 19.0	6 36.1	140	70
10 30	+34 38.0	− 19 54.2	6 36.4	140	70
35	35 12.9	21 31.5	6 36.3	139	69
40	35 45.9	23 11.4	6 35.7	139	69
45	36 17.0	24 54.1	6 34.7	139	68
50	36 46.2	26 40.2	6 33.3	140	66
55	37 13.3	28 29.9	6 31.4	140	65
11 00	+37 38.1	− 30 23.8	6 29.1	140	63
05	38 00.7	32 22.4	6 26.3	140	61
10	+38 20.8	− 34 26.1	6 23.0	141	59

ANNULAR ECLIPSE OF 1976 APRIL 29 (*Continued*)

h m	° ′	° ′	m s	*mi*	°
11 15	+38 38.1	− 36 35.6	6 19.4	142	57
20	38 52.6	38 51.6	6 15.3	143	55
25	39 03.7	41 15.2	6 10.8	144	52
11 30	+39 11.3	− 43 47.3	6 05.8	146	49
35	39 14.9	46 29.3	6 00.3	147	47
40	39 13.7	49 23.2	5 54.5	150	44
45	39 07.2	52 31.3	5 48.2	151	40
50	38 54.1	55 57.2	5 41.3	154	37
55	38 32.8	59 46.4	5 33.9	157	33
12 00	+38 00.7	− 64 08.0	5 25.7	160	29
05	37 12.7	69 19.4	5 16.5	165	24
10	35 56.8	76 03.9	5 05.6	170	17
15	33 06.2	88 27.6	4 48.4	180	6
Limit	+31 31	− 94 37	. .. .	...	..

Geocentric conjunction will occur in right ascension $2^h27^m21^s.00$, at E.T. $29^d10^h33^m21^s.4$, the declination of the Sun being $+14^\circ34'17''.4$.

The path of annular phase will begin in the central part of the Atlantic Ocean, will cross the northwestern part of Africa, the Mediterranean Sea, Turkey, the southern part of U. S. S. R., and will end in the central part of China. The partial phase will be visible in the northeastern part of South America, the extreme northeastern coast of North America, the southern coast of Greenland, Europe, the northern part of Africa, and Asia except the eastern part.

TOTAL ECLIPSE OF 1976 OCTOBER 23

Central Line

Ephemeris Time	Latitude	Ephemeris Longitude	Duration	Width of Path	Altitude of Sun
h m	° ′	° ′	m s	mi	°
Limit	- 4 05	- 31 09	• •• •	•••	••
3 40	7 29.8	44 36.8	2 33.5	103	15
45	9 46.0	51 19.8	2 52.1	109	23
50	11 34.7	55 57.3	3 06.5	113	29
55	13 10.1	59 38.1	3 18.8	117	34
4 00	-14 37.3	- 62 45.6	3 29.8	119	38
05	15 58.5	65 30.7	3 39.8	120	42
10	17 15.2	67 59.9	3 48.9	122	46
15	18 28.2	70 17.4	3 57.2	124	49
20	19 38.1	72 26.0	4 04.9	124	52
25	20 45.4	74 27.7	4 11.8	125	55
4 30	-21 50.3	- 76 24.2	4 18.2	126	58
35	22 53.0	78 16.7	4 23.9	126	60
40	23 53.8	80 06.2	4 28.9	126	62
45	24 52.8	81 53.6	4 33.4	126	65
50	25 50.1	83 39.8	4 37.2	126	66
55	26 45.8	85 25.3	4 40.4	126	68
5 00	-27 39.8	- 87 10.7	4 42.9	126	69
05	28 32.3	88 56.8	4 44.8	126	70
10	29 23.2	90 44.0	4 45.9	126	71
15	30 12.5	92 32.8	4 46.5	125	71
20	31 00.2	94 23.8	4 46.3	125	71
25	31 46.3	96 17.7	4 45.4	124	70
5 30	-32 30.7	- 98 14.8	4 43.8	124	69
35	33 13.3	100 16.0	4 41.5	124	67
40	33 54.1	102 21.7	4 38.6	123	65
45	34 32.8	104 32.9	4 34.9	122	63
50	35 09.3	106 50.2	4 30.4	121	61
55	35 43.5	109 14.8	4 25.3	120	59
6 00	-36 15.0	-111 47.6	4 19.4	120	56
05	36 43.5	114 30.0	4 12.8	119	53
10	-37 08.8	-117 23.8	4 05.4	118	50

TOTAL ECLIPSE OF 1976 OCTOBER 23 (*Continued*)

h	m	°	′	°	′	m	s	mi	°
6	15	-37	30.1	-120	31.2	3	57.3	117	47
	20	37	46.8	123	54.9	3	48.4	115	44
	25	37	58.1	127	39.2	3	38.5	114	40
6	30	-38	02.3	-131	50.0	3	27.6	112	36
	35	37	57.2	136	37.5	3	15.5	110	31
	40	37	38.5	142	20.6	3	01.6	107	26
	45	36	56.3	149	45.0	2	44.8	104	19
	50	35	02.0	162	39.5	2	18.9	97	7
Limit		-33	26	-171	04	.	.. .	...	..

Geocentric conjunction will occur in right ascension $13^h51^m23^s.21$, at E.T. $23^d05^h22^m41^s.9$, the declination of the Sun being $-11^\circ26'56''.1$.

The path of total phase will begin in central Africa, will cross the Indian Ocean, the southeastern coast of Australia, and will end in the Tasman Sea northwest of North Island, New Zealand. The partial phase will be visible in the eastern half of Africa, the extreme southern part of Asia, the southern part of New Guinea, the southern part of Indonesia, Australia, Tasmania, a portion of Antarctica, and New Zealand.

ANNULAR ECLIPSE OF 1977 APRIL 18

Central Line

Ephemeris Time h m	Latitude ° ′	Ephemeris Longitude ° ′	Duration m s	Width of Path *mi*	Altitude of Sun °
Limit	-38 05	+ 32 30	. .. .	...	..
8 45	36 06.2	23 31.6	5 00.2	159	8
50	33 04.9	12 59.4	5 16.0	151	18
55	31 03.1	7 14.1	5 26.8	147	24
9 00	-29 21.9	+ 3 00.8	5 35.9	144	29
05	27 52.5	- 0 23.0	5 44.0	142	33
10	26 31.2	3 14.9	5 51.5	140	37
15	25 15.9	5 44.4	5 58.5	138	40
20	24 05.5	7 57.2	6 05.0	136	43
25	22 59.1	9 57.1	6 11.1	136	46
9 30	-21 56.0	- 11 46.8	6 16.9	135	49
35	20 55.9	13 28.3	6 22.4	134	51
40	19 58.4	15 03.0	6 27.4	133	54
45	19 03.3	16 32.2	6 32.2	133	56
50	18 10.3	17 56.9	6 36.6	133	58
55	17 19.3	19 17.7	6 40.7	132	60
10 00	-16 30.1	- 20 35.4	6 44.4	132	61
05	15 42.7	21 50.6	6 47.8	133	63
10	14 56.9	23 03.8	6 50.7	133	64
15	14 12.7	24 15.4	6 53.3	133	65
20	13 30.0	25 25.9	6 55.4	134	66
25	12 48.8	26 35.5	6 57.1	135	66
10 30	-12 09.0	- 27 44.8	6 58.4	135	66
35	11 30.6	28 54.0	6 59.2	136	66
40	10 53.6	30 03.5	6 59.5	136	66
45	10 18.0	31 13.6	6 59.3	137	65
50	9 43.8	32 24.7	6 58.6	138	65
55	9 11.1	33 37.1	6 57.4	139	63
11 00	- 8 39.8	- 34 51.4	6 55.6	140	62
05	8 10.0	36 07.7	6 53.3	141	61
10	- 7 41.8	- 37 26.8	6 50.5	142	59

ANNULAR ECLIPSE OF 1977 APRIL 18 (*Continued*)

h	m	°	′	°	′	m	s	*mi*	°
11	15	– 7	15.2	– 38	49.0	6	47.1	143	57
	20	6	50.3	40	14.9	6	43.1	143	55
	25	6	27.3	41	45.5	6	38.7	144	53
11	30	– 6	06.3	– 43	21.3	6	33.6	145	50
	35	5	47.5	45	03.7	6	28.1	146	48
	40	5	31.1	46	53.9	6	22.0	147	45
	45	5	17.7	48	53.7	6	15.3	148	42
	50	5	07.5	51	05.7	6	08.0	149	39
	55	5	01.4	53	33.3	6	00.0	151	35
12	00	– 5	00.5	– 56	22.2	5	51.3	152	32
	05	5	06.8	59	41.9	5	41.7	154	27
	10	5	24.0	63	51.4	5	30.7	156	22
	15	6	02.6	69	43.6	5	17.1	159	15
Limit		– 8	18	– 83	24	•	•• •	•••	••

Geocentric conjunction will occur in right ascension $1^h45^m01^s.26$, at E.T. $18^d10^h18^m46^s.2$, the declination of the Sun being $+10^\circ51'26''.1$.

The path of annular phase will begin in the central part of the South Atlantic Ocean, will cross the southern part of Africa, and will end in the north central part of the Indian Ocean. The partial phase will be visible in the northeastern part of South America, a small part of Antarctica, the South Atlantic Ocean, Africa except the northwestern part, the extreme southern part of Asia, and the Indian Ocean.

TOTAL ECLIPSE OF 1977 OCTOBER 12

Central Line

Ephemeris Time	Latitude	Ephemeris Longitude	Duration	Width of Path	Altitude of Sun
h m	° ′	° ′	m s	*mi*	°
Limit	+38 58	−170 28	• •• •	•••	••
18 50	37 44.2	−178 21.7	0 44.7	29	6
55	34 55.5	+168 48.0	1 03.3	36	18
19 00	+33 00.4	+162 11.6	1 15.2	40	25
05	31 22.4	157 22.4	1 25.0	44	30
10	29 54.0	153 30.1	1 33.7	46	35
15	28 32.3	150 14.0	1 41.5	48	39
20	27 15.6	147 23.2	1 48.7	50	42
25	26 03.0	144 51.2	1 55.3	52	45
19 30	+24 53.8	+142 33.6	2 01.4	53	48
35	23 47.4	140 27.3	2 07.0	55	51
40	22 43.5	138 30.2	2 12.1	56	54
45	21 41.8	136 40.6	2 16.7	57	56
50	20 42.2	134 57.0	2 20.9	58	59
55	19 44.4	133 18.3	2 24.7	59	61
20 00	+18 48.3	+131 43.7	2 27.9	59	62
05	17 53.9	130 12.3	2 30.7	60	64
10	17 00.9	128 43.4	2 33.0	61	65
15	16 09.4	127 16.6	2 34.9	62	66
20	15 19.3	125 51.1	2 36.2	63	67
25	14 30.5	124 26.5	2 37.1	63	67
20 30	+13 43.0	+123 02.2	2 37.4	63	67
35	12 56.7	121 37.9	2 37.2	63	67
40	12 11.8	120 13.0	2 36.6	63	66
45	11 28.1	118 47.1	2 35.3	63	65
50	10 45.7	117 19.5	2 33.6	63	64
55	10 04.6	115 49.9	2 31.4	63	62
21 00	+ 9 24.9	+114 17.5	2 28.7	63	61
05	8 46.5	112 41.7	2 25.4	63	59
10	8 09.7	111 01.8	2 21.6	62	56
15	7 34.4	109 16.8	2 17.3	61	54
20	7 00.8	107 25.6	2 12.4	60	51
25	+ 6 29.1	+105 26.8	2 07.0	59	48

TOTAL ECLIPSE OF 1977 OCTOBER 12 (*Continued*)

h m	° ′	° ′	m s	*mi*	°
21 30	+ 5 59.5	+103 18.6	2 01.0	57	45
35	5 32.3	100 58.6	1 54.5	55	42
40	5 08.1	98 23.4	1 47.3	53	39
45	4 47.5	95 27.8	1 39.4	51	35
50	4 31.7	92 03.3	1 30.5	48	30
55	4 23.1	87 53.6	1 20.5	44	25
22 00	+ 4 27.1	+ 82 19.1	1 08.3	40	18
05	5 12.6	71 47.9	0 49.1	32	6
Limit	+ 5 57	+ 65 38	• •• •	•••	••

Geocentric conjunction will occur in right ascension $13^h11^m34^s.81$, at E.T. $12^d20^h15^m15^s.1$, the declination of the Sun being $-7^\circ35'18''.3$.

The path of total phase will begin in the North Pacific Ocean, northwest of the Hawaiian Islands, will continue in a southeasterly direction, will cross Colombia in South America, and will end in Venezuela. The partial phase will be visible in the extreme northeastern part of Asia, the Hawaiian Islands, North America except the northeastern part, the West Indies, and the northwestern part of South America.

PARTIAL ECLIPSE OF 1978 APRIL 7

Geocentric conjunction will occur in right ascension $1^h04^m12^s.11$, at E.T. $7^d14^h26^m19^s.6$, the declination of the Sun being $+6^\circ50'08''.1$. The greatest eclipse will have a magnitude of 0.788 at longitude $-22^\circ58'$, latitude $-71^\circ57'$.

The eclipse will be visible in the southern part of South America, the southern part of Africa, part of Antarctica, and the South Atlantic Ocean.

PARTIAL ECLIPSE OF 1978 OCTOBER 2

Geocentric conjunction will occur in right ascension $12^h31^m54^s.51$, at E.T. $2^d05^h46^m50^s.3$, the declination of the Sun being $-3^\circ26'35''.7$. The greatest eclipse will have a magnitude of 0.691 at longitude $-159^\circ25'$, latitude $+72^\circ07'$.

The eclipse will be visible in the northern part of Europe, in Asia except the southern part, and in the arctic regions.

TOTAL ECLIPSE OF 1979 FEBRUARY 26

Central Line

Ephemeris Time	Latitude	Ephemeris Longitude	Duration	Width of Path	Altitude of Sun
h m	° ′	° ′	m s	*mi*	°
Limit	+47 16	+139 38	• •• •	•••	••
16 10	47 01.6	138 01.0	1 51.5	147	1
15	45 51.1	123 48.6	2 14.0	170	12
20	46 01.6	117 48.2	2 24.3	181	16
25	46 29.9	113 17.9	2 31.8	188	19
16 30	+47 08.6	+109 31.7	2 37.5	192	21
35	47 55.3	106 11.4	2 41.9	194	23
40	48 48.6	103 07.5	2 45.2	195	24
45	49 48.1	100 13.8	2 47.4	193	25
50	50 53.7	97 25.9	2 48.7	192	26
55	52 05.5	94 40.1	2 49.0	189	26
17 00	+53 24.0	+ 91 52.9	2 48.4	185	26
05	54 50.0	89 00.8	2 46.9	181	25
10	56 24.7	85 59.4	2 44.5	177	24
15	58 09.8	82 42.9	2 41.0	173	23
20	60 08.3	79 02.7	2 36.4	168	21
25	62 25.1	74 44.2	2 30.5	163	19
17 30	+65 09.9	+ 69 17.4	2 22.8	159	16
35	68 47.9	61 18.2	2 12.4	154	11
Limit	+77 10	+ 34 13	• •• •	•••	••

TOTAL ECLIPSE OF 1979 FEBRUARY 26 (*Continued*)

Geocentric conjunction will occur in right ascension $22^h36^m49^s.72$, at E.T. $26^d17^h22^m09^s.0$, the declination of the Sun being $-8^\circ44'58''.5$.

The path of total phase will begin in the North Pacific Ocean, will cross the northwestern part of the United States and the central part of Canada, and will end in the northern part of Greenland. The partial phase will be visible in the North Pacific Ocean, North America except the western part of Alaska, the arctic regions, Greenland except the northeastern part, Iceland, the United Kingdom except the eastern part, the Brittany peninsula, the western part of the Iberian peninsula, and the North Atlantic Ocean.

ANNULAR ECLIPSE OF 1979 AUGUST 22

Central Line

Ephemeris Time h m	Latitude ° ′	Ephemeris Longitude ° ′	Duration m s	Width of Path *mi*	Altitude of Sun °
Limit	-58 19	+142 24	• •• •	•••	••
16 55	56 31.4	131 08.5	5 40.2	590	7
17 00	-56 18.8	+124 44.2	5 47.9	610	10
05	56 37.4	120 14.8	5 52.7	618	12
10	57 12.8	116 33.3	5 55.9	617	14
15	58 00.9	113 17.6	5 57.9	609	14
20	59 00.5	110 16.6	5 58.8	595	15
25	60 11.8	107 23.2	5 58.7	579	15
17 30	-61 36.0	+104 31.7	5 57.6	563	14
35	63 16.1	101 36.4	5 55.5	548	14
40	65 17.8	98 30.1	5 52.2	536	12
45	67 53.6	95 01.5	5 47.4	530	10
50	71 44.4	90 42.7	5 39.7	536	6
Limit	-78 11	+ 86 40	• •• •	•••	••

Geocentric conjunction will occur in right ascension $10^h04^m40^s.95$, at E.T. $22^d17^h52^m39^s.1$, the declination of the Sun being $+11^\circ48'29''.9$.

The path of the annular phase will begin in the South Pacific Ocean and will end in Antarctica. The partial phase will be visible in Oceania, the southern part of the South Pacific Ocean, the southern part of South America, a part of Antarctica, and the southern part of the South Atlantic Ocean.

TOTAL ECLIPSE OF 1980 FEBRUARY 16

Central Line

Ephemeris Time	Latitude	Ephemeris Longitude	Duration	Width of Path	Altitude of Sun
h m	° ′	° ′	m s	*mi*	°
Limit	− 1 23	+ 14 58	• •• •	•••	••
7 15	3 37.9	+ 4 06.7	1 46.6	63	12
20	4 58.4	− 4 07.7	2 06.9	69	21
25	5 36.2	9 23.8	2 22.0	74	28
7 30	− 5 56.3	− 13 30.3	2 34.9	77	33
35	6 05.8	16 56.7	2 46.4	79	38
40	6 07.8	19 56.5	2 56.9	82	42
45	6 04.0	22 37.1	3 06.6	84	45
50	5 55.5	25 03.1	3 15.4	86	49
55	5 43.2	27 17.5	3 23.6	87	52
8 00	− 5 27.4	− 29 22.6	3 31.1	89	56
05	5 08.7	31 20.0	3 37.8	90	59
10	4 47.3	33 11.0	3 43.9	91	61
15	4 23.4	34 56.7	3 49.4	92	64
20	3 57.2	36 37.9	3 54.1	93	67
25	3 28.9	38 15.4	3 58.2	93	69
8 30	− 2 58.6	− 39 49.6	4 01.5	94	71
35	2 26.2	41 21.3	4 04.2	94	73
40	1 52.0	42 50.9	4 06.2	94	75
45	1 16.0	44 18.8	4 07.4	94	76
50	− 0 38.1	45 45.5	4 08.0	94	77
55	+ 0 01.5	47 11.5	4 08.0	94	77
9 00	+ 0 43.0	− 48 37.0	4 07.2	94	77
05	1 26.2	50 02.7	4 05.8	94	76
10	2 11.4	51 28.8	4 03.7	93	74
15	2 58.4	52 55.9	4 01.1	93	72
20	3 47.3	54 24.5	3 57.8	92	70
25	4 38.4	55 55.0	3 53.8	91	68
9 30	+ 5 31.5	− 57 28.2	3 49.3	90	66
35	6 27.0	59 04.6	3 44.2	90	63
40	+ 7 24.9	− 60 45.2	3 38.6	89	60

TOTAL ECLIPSE OF 1980 FEBRUARY 16 (*Continued*)

h	m	°	′	°	′	m	s	*mi*	°
9	45	+ 8	25.5	– 62	30.9	3	32.3	88	57
	50	9	29.1	64	23.0	3	25.5	86	54
	55	10	36.1	66	23.0	3	18.0	86	51
10	00	+11	47.0	– 68	33.0	3	10.0	84	48
	05	13	02.4	70	55.7	3	01.3	82	44
	10	14	23.3	73	35.1	2	51.9	80	40
	15	15	51.3	76	37.3	2	41.6	78	36
	20	17	28.8	80	12.7	2	30.2	75	31
	25	19	20.7	84	41.3	2	17.2	72	25
10	30	+21	39.0	– 90	54.6	2	01.3	68	18
	35	26	00.6	105	55.9	1	31.5	59	2
Limit		+26	35	–108	23	.	.. .	...	..

Geocentric conjunction will occur in right ascension $21^h56^m14^s.83$, at E.T, $16^d08^h59^m51^s.4$, the declination of the Sun being $-12^\circ33'56''.8$.

The path of total phase will begin in the South Atlantic Ocean, will cross Africa south of the equator, the Arabian Sea, the southern part of India, and will end in the southern part of China. The partial phase will be visible in the South Atlantic Ocean, Africa except for the extreme northern part, the southern half of Asia, most of Indonesia, the Philippine Islands except the eastern part, and the northern part of the Indian Ocean.

ANNULAR ECLIPSE OF 1980 AUGUST 10

Central Line

Ephemeris Time	Latitude	Ephemeris Longitude	Duration	Width of Path	Altitude of Sun
h m	° ′	° ′	m s	*mi*	°
Limit	+ 1 07	+168 53	• •• •	•••	••
17 20	2 23.6	164 12.2	2 46.2	90	5
25	5 10.2	153 09.6	2 50.9	82	18
17 30	+ 6 22.0	+147 37.8	2 53.9	78	24
35	7 08.0	143 30.7	2 56.5	76	30
40	7 39.8	140 08.1	2 58.8	74	34
45	8 02.0	137 14.0	3 01.0	72	38
50	8 17.1	134 40.0	3 03.0	71	42
55	8 26.5	132 21.0	3 04.9	69	46
18 00	+ 8 31.3	+130 13.8	3 06.7	67	49
05	8 32.1	128 16.0	3 08.4	67	52
10	8 29.3	126 26.2	3 09.9	66	55
15	8 23.5	124 42.8	3 11.3	65	58
20	8 14.9	123 05.0	3 12.6	64	60
25	8 03.7	121 31.9	3 13.8	63	63
18 30	+ 7 50.1	+120 02.8	3 14.8	63	65
35	7 34.3	118 37.2	3 15.7	63	68
40	7 16.3	117 14.6	3 16.4	62	70
45	6 56.4	115 54.6	3 17.0	61	72
50	6 34.5	114 36.7	3 17.5	61	74
55	6 10.7	113 20.6	3 17.8	61	76
19 00	+ 5 45.0	+112 06.1	3 17.9	60	77
05	5 17.6	110 52.7	3 18.0	60	78
10	4 48.4	109 40.2	3 17.9	60	79
15	4 17.5	108 28.4	3 17.7	60	79
20	3 44.8	107 16.8	3 17.4	60	78
25	3 10.3	106 05.3	3 16.9	60	77
19 30	+ 2 34.0	+104 53.5	3 16.4	60	76
35	1 56.0	103 41.1	3 15.8	61	74
40	1 16.0	102 27.8	3 15.1	61	72
45	+ 0 34.1	101 13.2	3 14.3	62	70
50	− 0 09.8	99 56.9	3 13.5	62	68
55	− 0 55.8	+ 98 38.5	3 12.5	63	65

ANNULAR ECLIPSE OF 1980 AUGUST 10 (*Continued*)

h m	° ′	° ′	m s	*mi*	°
20 00	− 1 44.1	+ 97 17.3	3 11.6	63	63
05	2 34.8	95 52.9	3 10.5	64	60
10	3 28.0	94 24.5	3 09.5	65	57
15	4 24.2	92 51.2	3 08.3	66	55
20	5 23.4	91 11.9	3 07.2	67	52
25	6 26.3	89 25.2	3 05.9	68	49
20 30	− 7 33.3	+ 87 29.3	3 04.6	70	45
35	8 45.2	85 21.7	3 03.3	71	42
40	10 03.0	82 58.7	3 01.9	74	38
45	11 28.5	80 14.8	3 00.4	75	34
50	13 04.5	77 00.6	2 58.8	78	29
55	14 56.2	72 57.8	2 56.9	82	24
21 00	−17 17.3	+ 67 19.1	2 54.7	86	17
05	22 03.8	53 11.6	2 50.5	95	2
Limit	−22 33	+ 51 30	. .. .	...	..

Geocentric conjunction will occur in right ascension $9^h22^m52^s.54$, at E.T. $10^d19^h17^m05^s.9$, the declination of the Sun being $+15^\circ20'58''.8$.

The path of annular phase will begin in the South Pacific Ocean, north of the Phoenix Islands, will cross the central part of the Pacific Ocean, Peru, Bolivia, Paraguay, and will end in southeastern Brazil. The partial phase will be visible in the Hawaiian Islands, Oceania, the central part of the Pacific Ocean, the southwestern part of North America, most of the West Indies, and South America.

CORRECTION

UNITED STATES NAVAL OBSERVATORY CIRCULAR NO. 101

ANNULAR ECLIPSE OF 1973 DECEMBER 24

Ephemeris Time			Duration		Duration
h	m		m s		m s
13	50	for	0 04.8	read	10 04.8
	55		0 19.7		10 19.7
14	00		0 33.7		10 33.7
	05		0 46.8		10 46.8
	10		0 58.9		10 58.9
	15		1 10.1		11 10.1
	20		1 20.2		11 20.2
	25		1 29.2		11 29.2
14	30		1 36.9		11 36.9
	35		1 43.5		11 43.5
	40		1 48.8		11 48.8
	45		1 52.8		11 52.8
	50		1 55.5		11 55.5
	55		1 56.8		11 56.8
15	00		1 56.8		11 56.8
	05		1 55.6		11 55.6
	10		1 53.0		11 53.0
	15		1 49.3		11 49.3
	20		1 44.4		11 44.4
	25		1 38.3		11 38.3
15	30		1 31.3		11 31.3
	35		1 23.3		11 23.3
	40		1 14.3		11 14.3
	45		1 04.5		11 04.5
	50		0 54.0		10 54.0
	55		0 42.8		10 42.8
16	00		0 30.9		10 30.9
	05		0 18.3		10 18.3
	10		0 05.2		10 05.2

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